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JAPANESE TRADE STUDIES

Special Industry Analysis

No. 9

GLASS AND GLASSWARE

Prepared for the
Foreign Economic Administration
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FOREWORD

This is one of a series of special Industry Analyses discussing from a commodity or individual industry viewpoint the outstanding items entering into the trade of Japan proper with its Empire and with foreign countries. These analyses are a part of a larger project which includes compilations (annotated) of the imports and exports of Japan proper by sources and destinations; surveys of certain of the colonial areas, emphasizing their Empire and foreign trade and post-war problems relating thereto; an over-all study of the trade of Japan proper; and a survey of Japan's shipbuilding industry and shipping services and requirements in the pre-war period. In all of the studies Manchuria has been included as an Empire area owing to the political, economic, and military dominance Japan in that area, especially during the last decade.

Most of the data in these analyses were taken from official and semi-official Japanese sources. Not only have errors and inconsistencies frequently been detected within individual volumes, but many data from different sources supposedly reporting on the same subject are irreconcilable. It is very likely that large shipments of goods reportedly moving to Kwantung from Japan have been in large part merely transshipments destined for Manchuria. In addition, the data probably exclude large shipments of commodities made to and from Empire areas for military purposes.

The present report is one of a number which were prepared during 1944 and 1945 for the Foreign Economic Administration by members of the staff of the United States Tariff Commission. Owing to the desire of the Foreign Economic Administration to obtain this material as promptly as possible, the reports were not reviewed by the Tariff Commission. All statements of fact or opinion in these reports are attributable to the individual staff members who prepared them. The reports were originally intended for confidential use of Government agencies, but are now being made public with the consent of the Foreign Economic Administration.

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GLASS AND GLASSWARE

Introduction and summary.

Within the last two decades Japan has become increasingly active in the field of glass manufacture and has developed a highly diversified industry within Japan proper. Plants controlled by Japanese interests also have been built in Manchuria and in Kwantung Province. Although Japan's per capita consumption of glass has been very low - less than one-tenth of that in the United States - glass and glassware production has been one of Japan's important industries. The factors favoring the industry have been adequate sources of raw materials and fuel, a large body of efficient low-priced labor, and a high degree of rationalization and mechanization. Before the war the industry gave employment to nearly 27,000 persons in its more than 700 factories; a large number also are employed in the many "household" or small shops scattered throughout the country.

Annual reported production of glass and glassware in Japan during 1935-39 averaged 87 million yen in value. This amount is less than one-tenth of the value of United States production of similar products in the same years. It is, however, more than double Japanese production in 1930. In 1937 the glass industry accounted for about half of one percent of the gross value of Japanese production.

Japan, prior to the war, was practically self-sufficient in all glass and glassware products. Imports of these commodities, which amounted to a fraction of total Japanese imports, decreased from 9.2 million yen in 1929 to 2.7 million yen in 1938. Exports of glass and glassware, on the other hand, steadily increased from 16.2 million yen in 1929 to 33.6 million yen in 1938, when they amounted to about one percent of all Japanese exports. The increase in exports in recent years may be attributed largely to low Japanese manufacturing costs as compared to those in most other countries, to the depreciation of Japanese currency, and, to a lesser extent, to the expanded range of export articles. The principal foreign markets for Japanese glass and glassware exports during 1933-37 were British India, the Netherlands East Indies, the United States, China, Australia, and the Philippine Islands. Empire areas provided a market for 22 percent of the exports during 1933-37, and 33 percent in 1938. Sheet glass, thermostatic containers, ophthalmic glass, bottles, cups, and glass novelties constituted the bulk of these exports. Because of the low prices and low transportation charges on Japanese glass products, southeast Asia, China, and adjacent countries have relied on Japan for most of their glass during the past decade.

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There are few glass manufacturing plants in the Far East and, inasmuch as (1) the glass industry is as much a peacetime as a wartime industry and (2) the Japanese have the raw materials, skilled labor, plant, and technical knowledge necessary for this type of enterprise, it would seem logical that the industry in Japan should be allowed to continue operations after the war. It might serve as one means by which Japan could help rehabilitate itself or even make reparation payments to the surrounding countries. Furthermore, the glass plants in the United States

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and Europe are expected to be fully occupied in serving their respective post-war markets and would be unable to supply Japan or Japan's former markets expeditiously. Bombing and other military measures will probably destroy part of the Japanese glass plants, but some of the factories will undoubtedly remain because of their number and scattered distribution. The rebuilding of Japanese plants may be necessary to serve the immediate post-war requirements for glass. Limiting factors to the reestablishment of a large post-war export trade are the possibility that trade barriers may be erected against Japanese imports, and that other occupied countries may follow China's lead in planning domestic glass industries partly supplied with machinery and skilled labor from Japan.

It could be difficult to enforce restrictions on the manufacture in Japan of glass articles having military applications. A greater part of the output of optical glass, safety glass, and other articles now used by the military is manufactured or processed in small household shops throughout the country. Furthermore, the same ingredients and processes of manufacture are used for many of these products as are used for glass products of nonmilitary character.

Description and uses.

The term glass is applied to a wide variety of products made by fusing silica sand, soda ash, lime, and other materials. The type of materials employed and their properties vary with the nature of the products. The simpler forms of glass, such as flat glass, bottles, and ordinary table glassware, are made in Japan by machinery, but other forms of glass require much hand labor. In terms of quantity, flat glass is the most important Japanese glass product. It includes window or sheet glass, plate glass, rolled and wired glass, safety or laminated glass, and photographic glass. Japan ranks high in the production of glass bottles. It has a large trade in tumblers, wine glasses, other table and kitchen glassware, as well as artware. Other glassware produced in Japan includes incandescent lamps and other glass lighting fixtures, scientific, chemical, and medical glassware. A recent development in the Japanese industry is fiber glass which has many uses in textiles, plastics, and insulation. Japanese statistics do not indicate the amount of glass products consumed for military purposes and consequently no estimate can be made in this respect. However, optical glass, laminated glass, fiber glass, and numerous other types are very essential in modern warfare.

Summary of production, imports, exports, and apparent consumption.

The adequacy of Japanese glass production statistics is limited by the fact that "cottage" or "household" shops employing five persons or less are not required to report their output. Many products of the glass and glassware industry are manufactured in these small shops and consequently are not included in the official statistics. Besides, great secrecy is maintained on all items having anything to do with military matters. Statistics covering such products as optical glass, laminated glass, scientific glassware, and glass for medical use, all of which are vital to military operations, are very confusing.

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A summarization of production, imports, exports, and consumption of glass and glassware in Japan proper is given in table 1 for the years 1928-39. Production during this period increased progressively due largely to an expanding export demand for the wide variety of relatively inexpensive products manufactured. Only those types of glass and glassware which were not produced in Japan proper have been imported. Uncolored plate and sheet glass of 22 mm or less in thickness used for window panes is the principal glass manufactured in the Kwantung Leased Territory and enters Japan proper duty free. This glass together with the, manufactured in Manchuria constitutes most of the glass imported from the Empire areas. The greater part of the glass imported from other countries, namely, Great Britain, France, Belgium, Czechoslovakia, Germany, and the United States, has consisted of polished plate glass, figured glass, wire glass, and photographic glass. Imports have been steadily decreasing as the country has become more self-sufficient. The ratio of imports to apparent consumption decreased from about 22 percent in the period 1928-32 to 12 percent in the period 1933-37. In 1938 this ratio had declined still further, amounting to only 3.5 percent.

The export of glass and glassware during this same period increased not only to the Empire areas but to other parts of the world. During 1933-37 the exports to Empire areas amounted to somewhat under one-fourth of the total exports. The ratio of total exports to domestic production increased from an average of 32 percent in the years 1928-32 to 40 percent for the period 1933-37. In 1938 the ratio amounted to 32 percent.

The apparent consumption, as shown in the table, likewise increased. In view of the probable inaccuracies of the published production figures, and the doubt which exists regarding the completeness and accuracy of export and import data, consumption data are, however, not wholly reliable. Actual consumption is thought to be larger than appears in the table.

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Table 1.- Glass and glassware: Summary of production, imports, exports, and consumption in Japan proper and Karafuto, 1928-39, with averages, 1928-32, and 1933-37

(In thousands of yen)

Year	: Production :	: Imports from :		: Exports to :		: Apparent consumption :
		Empire areas:	Other	Empire areas:	Other	
		1/		1/		
1928 ----	: 44,681 :	2/ 508 :	9,442 :	3,605 :	12,267 :	38,759
1929 ----	: 44,669 :	2/ 545 :	8,646 :	3,872 :	12,487 :	37,501
1930 ----	: 40,583 :	2/ 789 :	6,805 :	3,048 :	9,165 :	35,964
1931 ----	: 34,338 :	2/ 265 :	5,613 :	2,361 :	6,335 :	31,520
1932 ----	: 37,233 :	2/ 680 :	6,158 :	2,829 :	8,849 :	32,393
Average	:	:	:	:	:	:
1928-32	: 40,301 :	557 :	7,333 :	3,143 :	9,820 :	35,228
1933 ----	: 52,526 :	2/ 770 :	6,668 :	3,969 :	14,424 :	41,571
1934 ----	: 58,857 :	2/ 761 :	6,767 :	4,692 :	18,422 :	43,271
1935 ----	: 68,173 :	3/ 340 :	6,070 :	5,996 :	22,002 :	46,585
1936 ----	: 78,360 :	3/ 552 :	3,345 :	7,249 :	24,006 :	51,002
1937 ----	: 96,375 :	2/ 74 :	3,955 :	9,449 :	31,022 :	59,933
Average	:	:	:	:	:	:
1933-37	: 70,858 :	499 :	5,361 :	6,271 :	21,975 :	48,472
1938 ----	: 104,970 :	3/ 170 :	2,480 :	11,139 :	22,431 :	74,050
1939 ----	: 4/ :	5/ 896 :	6/ 1,388 :	7/ 12,851 :	22,168 :	4/

- 1/ Does not include Mandated Islands, for which statistics are not available.
- 2/ Formosa and Kwantung province.
- 3/ Formosa, Kwantung, and Manchuria.
- 4/ Not available.
- 5/ Korean statistics only.
- 6/ Includes Manchuria and Kwantung province.
- 7/ Does not include Formosa.

Source: Annual and Monthly Returns of the Foreign Trade of Japan; Annual Returns of the Trade of Taiwan (Formosa); Tables of Trade and Shipping of Chosen (Korea); The Japan Year book, 1938-39, 1940-41.

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Organization and equipment.

The glass industry of Japan comprises a few large glass companies, some smaller establishments, and hundreds of household shops. The large companies manufacture a diversified line of glass and glassware products, but the individual smaller plants and home shops often confine their efforts to the production of a single type of glass article such as chemical glassware, small electric light bulbs, ophthalmic lenses, or watch crystals. There were 765 glass plants ^{1/} recorded in Japan proper in 1939 employing 5 or more laborers each, a gain of 10 percent over the previous year. Reports state that in 1934 the average plant employed 27.8 people. ^{2/}

The Asahi Glass Company, Ltd., a Mitsubishi affiliate, is the oldest and best equipped concern in the domestic industry; its plants are located at Amagasaki, Tobata, Yawata, Yokohama, and Ito. Exclusive of subsidiaries, this company employed 5,000 persons in 1937. In 1940, Asahi had a capacity of 516 million square feet of sheet and plate glass. ^{3/}

Osaka, Fukuoka, Hyogo, Kanagawa, Tokyo, and Aichi are the most noted glass producing districts in Japan. These 6 prefectures are said to account for over 96 percent of the production of the whole country. ^{4/} In spite of the low wages paid in Japan, modern machinery is used wherever possible, especially in the larger factories.

The Asahi Company has two subsidiaries on the mainland: the Shoko Glass Company, established in 1925 at Dairen, Kwantung, and the Manchuria Shoko Glass Company, established in 1937 at Mukden, Manchuria. Each of these establishments is capitalized at 3 million yen. In 1939 the Shoko Glass Company at Dairen is reported to have had an annual capacity of 1,200,000 cases (100 sq. ft. per case) of sheet glass and the Manchuria Shoko plant a capacity of 800,000 cases. ^{5/}

The household shops are to a large extent organized and directed by the larger concerns and by dealers. Many of the glass products so produced require little equipment and, therefore, readily lend themselves to this household type of manufacture.

^{1/} Consular Report, 1938.

^{2/} Consular Report, 1937.

^{3/} The Japan Trade Guide, 1940, p. 447.

^{4/} The Japan-Manchoukuo Year Book, 1941, p. 402.

^{5/} Ibid.: p. 807.